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10/765,461	01/26/2004	Charles Patrick Rehberg	16887-002001	8603

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EXAMINER

CALDWELL, MICHAEL J

ART UNIT	PAPER NUMBER
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2129

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/765,461

Applicant(s)

REHBERG ET AL.

Examiner

Michael Caldwell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This office action is responsive to application 10/765461, "RULE SELECTION ENGINE" filed January 26<sup>th</sup> 2004. Claims 1-11 have been examined.
2. Receipt is acknowledged of papers submitted July 6<sup>th</sup> 2004: Response to pre-exam formalities, including declaration pursuant to 37 C.F.R. 1.63 and corrected drawings pursuant to 37 C.F.R. 1.84 and 37 C.F.R. 1.121

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

As described through the claims outlined below, the claimed invention does not physically transform an article or physical object to a different state or thing; therefore to be eligible for patent protection, the claimed invention as a whole must accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept. The Supreme Court has specifically identified three categories of nonstatutory subject matter: laws of nature, natural phenomena, and abstract ideas. These are not categories of invention. See *Diamond v. Diehr*, 450 U.S. at 175, 209 USPQ 1 (1981). However when an abstract idea is reduced to a practical application, the abstract idea no longer stands alone if the practical application of the abstract idea produces a useful,

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concrete and tangible result. This then satisfies the requirements of 35 U.S.C. 101. [See *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 47 USPQ2d 1596, 1601-02 (Fed. Cir. 1998); *In re Alappat.*, 31 USPQ 2d 1545, 1558 (Fed. Cir. 1994)]

3. Claims 1-11 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. As written the claims do not appear to be limited to tangible embodiments. A data structure is defined to be a logical relationship among data elements that is designed to support specific data manipulation functions, wherein data is defined to be a representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by a programmable digital computer or automatic means. Merely accepting data in the form of a rules base (containing particular structure) as input and then processing the data to form a data structure does not result in a "useful, concrete, tangible result," as data and its structured form is considered to be abstract and thus not tangible, therefore not resulting in a "real-world result." Depending claims fail to further limit the claimed invention or add functionality so as to become patent eligible statutory subject matter.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Masui et al (U.S. Patent 5, 179, 632, herein referred to as Masui). Examiner suggests applicant review the entire teaching of Masui et al, as its entire teachings have been relied upon. When referring to a column and line number of the reference, the following nomenclature is used: CX, LY-Z representing column X, lines Y-Z.

**Regarding claim 1**

1. A method for processing rules (C 1, L 6-16) comprising:  
accepting a rules base comprising a plurality of rules (figures 1 & 2, also C 1, L 24-37, also C 2, L 50 through C 3, L 20) each rule including a condition that includes one or more condition element for application of the rule (C 1, L 9-54), at least some of the conditions including multiple condition elements (C 1, L 17 through C 2, L 35 where it states "the conditions being the structural data composed of the names of so-called current data and one or a plurality of pairs of attribute names and attribute values. The conditions of current data are constructed of a plurality of condition clauses representative of current data attributes, the condition clauses corresponding to nodes of the network" also C 9, L 42 through C 10, L 44, where it states "generating a hierarchical graph whose structural elements are LHS and RHS patterns"); and

processing the rules base to form a data structure (C 2, L 43 through C 3, L 20; "rule relation graph"), wherein the data structure includes for each of the plurality of rules storage locations (C 1, L 24-54, where it states "the current data

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are supplied to the network to check if the data satisfy the condition clauses stored in each node"; also C 2, L 43 through C 3, L 20) for holding Boolean values of the condition elements of the conditions for said rule (C 5, L 26 through C 6, L 24 where it states " 'X' represents a variable which takes a same number within a single rule" as well as C 13. Masui's variable could be of various types, including Boolean).

**Regarding claim 3**

3. The method of claim 1 further comprising:

processing a plurality of facts, including evaluating condition elements that depend on the facts (C 1, L 9-16; facts are merely something that is known, like the data used to determine whether or not conditions are satisfied), and storing results of evaluating the condition elements (C 5, L 26 through C 6, L 24 where it states " 'X' represents a variable which takes a same number within a single rule"; also C 13) in the storage locations for holding the values of the condition elements (C 1, L 24-54, where it states "the current data are supplied to the network to check if the data satisfy the condition clauses stored in each node"; also C 2, L 43 through C 3, L 20).

**Regarding claim 4**

4. The method of claim 1 wherein the data structure links each fact to corresponding condition elements that depend on that fact (C 2, L 38 through C 3, L 20; through the use of shortcut arcs and corresponding nodes of the network),

**Regarding claim 5**

5. The method of claim 4 further comprising processing a plurality of facts (C 1, L 9-16; facts are merely something that is known, like the data used to determine whether or not conditions are satisfied), including determining applicable rules of the plurality of rules based on the accepted facts by identifying condition elements that depend on the accepted facts using the data structure (C 1, L 9-16; RETE algorithm is an efficient pattern matching algorithm for implementing rule-based ("expert") systems described here and incorporated by reference, which determines applicability of rules).

**Regarding claim 6**

6. The method of claim 1 wherein the data structure includes for each of the plurality of rules, data values corresponding to the storage locations for the values of the condition elements (C 3, L 46-59 where it states "An attribute regarding the direction of information flow on an arc of the network is provided" This added attribute detailing the direction of information corresponds to applicant's data values for the storage locations of the values of the condition elements), said data values representing a logical combination of condition elements (C 3, L 46-59, also C 4, L 1-57; examiner reads the logical combination of the condition elements as the coupling between consequence and condition part networks, accomplished through this connecting arc).

**Regarding claim 7**

7. The method of claim 6 further comprising: identifying applicable ones of the plurality of rules using the data values (C 4, L 1-13) representing the logical combination of the condition elements and values stored in the storage locations for

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storing values of the condition elements (C 3, L 46-59, also C 4, L 1-57; examiner reads the logical combination of the condition elements as the coupling between consequence and condition part networks, accomplished through this connecting arc).

**Regarding claim 8**

8. A system for processing a rules base (C 1; L 6-16) comprising:

a data structure formed using a rules base that includes a plurality of rules (C 2, L 38-49; "rule relation graph"), each rule including a condition that includes one or more condition element for application of the rule (C 1, L 9-54), at least some of the conditions including multiple condition elements (C 1, L 17 through C 2, L 35 where it states "the conditions being the structural data composed of the names of so-called current data and one or a plurality of pairs of attribute names and attribute values. The conditions of current data are constructed of a plurality of condition clauses representative of current data attributes, the condition clauses corresponding to nodes of the network" also C 9, L 42 through C 10, L 44, where it states "generating a hierarchical graph whose structural elements are LHS and RHS patterns"), wherein the data structure includes for each of a plurality of rules of the rules base storage locations (C 1, L 24-54, where it states "the current data are supplied to the network to check if the data satisfy the condition clauses stored in each node"; also C 2, L 43 through C 3, L 20) for holding Boolean values of the condition elements of the conditions for said rule (C 5, L 26 through C 6, L 24 where it states "X represents



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a variable which takes a same number within a single rule" as well as C 13. Masui's variable could be of various types, including Boolean).; and

a compiler for processing the rules base (C 1-5, particularly C 1, L 5 through C 3, L 20, where it states "The conditions of current data are constructed of a plurality of condition clauses representative of current data attributes, the condition clauses corresponding to nodes of the network" The compiling section is the construction of the plurality of condition clauses), the rules base comprising a plurality of rules (figures 1 & 2, also C 1, L 24-37, also C 2, L 50 through C 3, L 20), each rule including a condition that includes one or more condition element for application of the rule (C 1, L 9-54), at least some of the conditions including multiple condition elements (C 1, L 17 through C 2, L 35 where it states "the conditions being the structural data composed of the names of so-called current data and one or a plurality of pairs of attribute names and attribute values. The conditions of current data are constructed of a plurality of condition clauses representative of current data attributes, the condition clauses corresponding to nodes of the network. The following procedure is carried out to determine whether the conditions are satisfied or not..., " also C 9, L 42 through C 10, L 44, where it states "generating a hierarchical graph whose structural elements are LHS and RHS patterns").

#### **Regarding claim 9**

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## 9. A rules processing system comprising (C 1, L 6-16):

a data structure formed using a rules base that includes a plurality of rules (C 2, L 38-49; "rule relation graph"), each rule including a condition that includes one or more condition element for application of the rule (C 1, L 9-38), at least some of the conditions including multiple condition elements (C 1, L 17 through C 2, L 35 where it states "the conditions being the structural data composed of the names of so-called current data and one or a plurality of pairs of attribute names and attribute values. The conditions of current data are constructed of a plurality of condition clauses representative of current data attributes, the condition clauses corresponding to nodes of the network. The following procedure is carried out to determine whether the conditions are satisfied or not...", also C 9, L 42 through C 10, L 44, where it states "generating a hierarchical graph whose structural elements are LHS and RHS patterns"), wherein the data structure includes for each of a plurality of rules of the rules base storage locations (C 1, L 24-54, where it states "the current data are supplied to the network to check if the data satisfy the condition clauses stored in each node") for holding Boolean values of the condition elements of the conditions for said rule (C 5, L 26 through C 6, L 24 where it states " ?X represents a variable which takes a same number within a single rule" as well as C 13. Masui's variable could be of various types, including Boolean);

and a rules processing engine (Element 4 of Figure 1; since an engine is defined to be something that produces some effect from a given input, an inference program / inference engine and rules processing engine are equivalent) coupled to the data structure (Figure 1; also C 1, L 5-61; the data is connected to the structure through the process that analyzes it) for operation according to the rules base (C 2, L 37 through C 3, L 46).

**Regarding claim 10**

10. A data structure embodied in a computer-readable medium for use in rules processing (Figure 1; also C 2, L 38-49; "rule relation graph" this graph is created on a computer, therefore it is embodied in a computer readable medium) comprising:

storage locations for values associated with conditions for a plurality of rules in a rules base (C 1, L 24-54, where it states "the current data are supplied to the network to check if the data satisfy the condition clauses stored in each node"; also C 2, L 43 through C 3, L 20), wherein the rules base comprises a plurality of rules (C 2, L 38-49; "rule relation graph"), each rule including a condition that includes one or more condition element for application of the rule (C 1, L 9-54), at least some of the conditions including multiple condition elements (C 1, L 17 through C 2, L 35 where it states "the conditions being the structural data composed of the names of so-called current data and one or a plurality of pairs of attribute names and attribute values. The conditions of current data are constructed of a

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plurality of condition clauses representative of current data attributes, the condition clauses corresponding to nodes of the network" also C 9, L 42 through C 10, L 44, where it states "generating a hierarchical graph whose structural elements are LHS and RHS patterns"); wherein the data structure includes for each of the plurality of rules storage locations (C 1, L 24-54, where it states "the current data are supplied to the network to check if the data satisfy the condition clauses stored in each node"; also C 2, L 43 through C 3, L 20) for holding Boolean values of the condition elements of the conditions for said rule (C 5, L 26 through C 6, L 24 where it states "X represents a variable which takes a same number within a single rule" as well as C 13. Masui's variable could be of various types, including Boolean).

**Regarding claim 11**

11. Software comprising instructions embodied in a computer-readable medium for causing a computer system to:

accept a rules base comprising a plurality of rules (figures 1 & 2, also C 1, L 24-37, also C 2, L 50 through C 3, L 20), each rule including a condition that includes one or more condition element for application of the rule (C 1, L 9-54), at least some of the conditions including multiple condition elements(C 1, L 17 through C 2, L 35 where it states "the conditions being the structural data composed of the names of so-called current data and one or a plurality of pairs of attribute names and attribute values. The conditions of

current data are constructed of a plurality of condition clauses representative of current data attributes, the condition clauses corresponding to nodes of the network" also C 9, L 42 through C 10, L 44, where it states "generating a hierarchical graph whose structural elements are LHS and RHS patterns"); and

process the rules base to form a data structure (C 2, L 43 through C 3, L 20; "rule relation graph"), wherein the data structure includes for each of the plurality of rules storage locations (C 1, L 24-54, where it states "the current data are supplied to the network to check if the data satisfy the condition clauses stored in each node"; also C 2, L 43 through C 3, L 20) for holding Boolean values of the condition elements of the conditions for said rule (C 5, L 26 through C 6, L 24 where it states " 'X' represents a variable which takes a same number within a single rule" as well as C 13. Masui's variable could be of various types, including Boolean).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masui as applied to claim 1 above, and further in view of Moeller et al. (U.S. Patent 6, 151, 697, herein referred to as Meoller).

Masui fails to teach wherein the storage locations for holding values of the condition elements comprise bits of a bit vector with each condition element being associated with a different bit position in the bit vector.

Moeller teaches storage locations for holding values of the condition elements comprise bits of a bit vector with each condition element being associated with a different bit position in the bit vector (Moeller: C 7, L 58 through C 7, L 32; also C 2, L 6-63).

Being from the same field of endeavor, processing predetermined relationships and forming relationships from between data within a rule-based representation, it would have been obvious to one of ordinary skill at the time of applicant's invention to combine Masui's method for fast bi-directional inferencing with Moeller's enhancement of the information content of an input signal through binary pattern recognition to further speed Masui's inferencing engine (Moeller: C 7, L 10-13). This combination also has obvious advantages in reducing storage requirements (Moeller: C 1, L 30-43, also C 11, L 43-50)

#### ***Correspondence Information / Conclusion***

6. Claims 1-11 have been examined. Claims 1-11 have been rejected.

7. Prior art has been referenced but not cited. See PTO-892 references C through F


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Caldwell whose telephone number is (571) 272-1942. The examiner can normally be reached on Mon-Fri 10:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on (571) 272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJC  
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2/3/06  
DAVID VINCENT  
SUPERVISORY PATENT EXAMINER